

4 seeks to amend the text of block S11 so that the print desired data includes "image" data as set forth on pages 20-21 of the specification.

#### OBJECTIONS

Claim 8 stands objected to because it includes parenthesis. Since claim 8 has been amended to remove these parenthesis, as well as the parenthetical text, this objection should be withdrawn.

#### REJECTIONS UNDER 35 U.S.C. § 102

Claims 1, 2-11, and 13-20 stand rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,631,677 (hereafter referred to as "the Horigome patent"). The applicant respectfully requests that the Examiner reconsider and withdraw this ground of rejection in view of the following.

Independent claims 1 and 11 are not anticipated by the Horigome patent because the Horigome patent does not disclose a control section that performs print-operation-control such that a *remaining-battery-capacity detector is used to detect a remaining-battery-capacity level immediately before a paper transfer operation is commenced for the first sheet of the paper for a print operation which is commenced corresponding to a print-operation-commencement specification received from said*

*print-operation-commencement specifying section*, and that performs print-operation control such that when printing is consecutively performed on a plurality of sheets of the paper corresponding to a specified print-operation-commencement, **the remaining-battery-capacity detector is used to detect the remaining-battery-capacity level immediately before the paper transfer operation is performed for the print operation for each of the plurality of sheets of the paper.** Claims 1 and 11, as amended, are reprinted below with these features depicted in bold type-face:

1. A printer comprising:
  - a printing section for performing printing on paper;
  - a paper feed section for transferring paper, which is fed from a paper feed cassette, to said printing section;
  - a battery power source;
  - a remaining-battery-capacity detector for detecting a remaining-battery-capacity level of said battery power source;
  - a print-operation-commencement specifying section for specifying print-operation commencement; and
  - control section for performing print-operation control,**wherein,
  - said control section performs the print-operation control such that said remaining-battery-capacity detector is used to detect the remaining battery capacity level immediately before a paper transfer operation is commenced for the first sheet of the paper for a print operation which is commenced corresponding to a print-operation**

commencement specification received from said print-operation-commencement specifying section; and

said control section performs the print-operation control such that when printing is consecutively performed on a plurality of sheets of the paper corresponding to said print-operation commencement specification, said remaining-battery-capacity detector is used to detect the remaining battery capacity level immediately before the paper transfer operation is performed for the print operation for each of the plurality of sheets of the paper.

[Emphasis added.]

11. A printer comprising:

a printing section for performing printing on paper;

a paper feed section for transferring paper, which is fed from a paper feed cassette, to said printing section;

a remaining-battery-capacity detector for detecting a remaining-battery-capacity level of a battery power source;

a print-operation-commencement specifying section for specifying print-operation commencement; and

a control section

wherein,

said control section performs print-operation control based on the remaining battery capacity level detected by said remaining-battery-capacity detector immediately before a paper transfer operation is commenced for the first sheet of the paper for a print operation which is commenced corresponding to a print-operation commencement specification received from said print-operation-commencement specifying section; and

when printing is consecutively performed on a plurality of sheets of

the paper corresponding to said print-operation commencement specification, said control section performs print-operation control based on the detected remaining battery capacity level immediately before the paper transfer operation is performed for the print operation for each of the plurality of sheets of the paper. [Emphasis added.]

Each of these features will be addressed below. First, however, since this rejection apparently results from a misunderstanding of the Horigome patent, the Horigome patent is discussed.

The Horigome patent also concerns problems associated with a battery powered (inkjet) printer. However, the problems considered by the Horigome patent, and therefore its proposed solutions, are quite different than those in the present invention. More specifically, the Horigome patent seeks to (i) avoid the loss of print information, as well as the chance that an ink jet head will remain uncapped and prone to drying in the event that battery capacity is lost (See, e.g., column 1, lines 22-39.), (ii) avoid a system reset operation during a decline in battery voltage during intervals (referred to as "X intervals") in which both a paper feed motor and a carriage motor are simultaneously driven (See, e.g., column 1, line 62-column 2, line 18.), (iii) shorten a recharge time to be commensurate with a number of pages desired to be printed (See, e.g., column 12, lines 51-54.), and (iv) completely discharge a battery, to avoid the memory effect, without the need for a special discharging circuit (See, e.g., column 13, lines 52-57.).

To solve the first and second problems, the Horigome patent proposes a two-stage control procedure. (See, e.g., column 9, lines 11-19.) In this procedure, the capacity of a battery is sensed during printing, whenever a line is printed, and more specifically, when a carriage motor is being decelerated. (See, e.g., column 9, lines 13-16.) In a first stage, when the battery is partially depleted, the driving of the carriage motor and paper-feed motor are controlled so as not to overlap. (See, e.g., column 9, lines 20-44, and compare Figure 9 to Figure 8.) In the second stage, if the battery capacity becomes dangerously low, low-power error processing is performed. (See, e.g., column 9, lines 45-60.) More specifically, an off-line state is established, the carriage is returned to its home position and the printing head is capped. (See, e.g., column 11, lines 14-30, and steps S107, S111, S112, S208, S140, S142-S145.) As can be appreciated from the foregoing, in the Horigome patent, battery capacity checks occur after a sheet has already been transferred to a printing section -- namely during the printing of each line when a carriage motor is decelerated.

To solve the third problem, the Horigome patent monitors a battery capacity during the charging of the battery and determines when the battery has been charged enough to enable the printing of a desired number of sheets. (See, e.g., column 11, line 48-column 12, line 50 and Figure 11.) This allows the battery to be charged only to the extent needed to print the number of pages desired by a user and therefore shortens the charge waiting time. (See, e.g., column 12, lines 51-54.) As can be appreciated

by the foregoing, these operations occur only when the battery is being charged.

To solve the fourth problem, when it is desired to discharge the battery before changing it, in order to avoid the "memory effect", the Horigome patent drives the carriage motor and/or the paper-feed motor, or applies a current to a high consuming load (e.g., the print head or head restoration device) to discharge the battery, thereby avoiding the need for a separate discharge circuit. (See, e.g., column 13, lines 9-64.)

Having described the teachings of the Horigome patent, certain patentable features of the claimed invention are now addressed.

The Horigome patent does not disclose a control section that performs print-operation control such that a remaining-battery-capacity detector is used to ***detect a remaining-battery-capacity level immediately before a paper transfer operation is commenced for the first sheet of the paper for a print operation*** which is commenced corresponding to a print-operation-commencement specification received from said print-operation-commencement specifying section. As noted above, in the Horigome patent, the battery capacity is detected after printing has already commenced and therefore after the sheet of paper has been transferred (e.g., from a paper cassette to a printing section). Accordingly, claims 1 and 11 are not anticipated by the Horigome patent for at least this reason. Since claims 2-10 depend, either directly or indirectly, from claim 1, and since claims

13-20 depend, either directly or indirectly, from claim 11, these claims are similarly not anticipated by the Horigome patent.

Similarly, the Horigome patent does not disclose a control section that performs print-operation control such that when printing is consecutively performed on a plurality of sheets of the paper corresponding to a specified print-operation-commencement, the remaining-battery-capacity detector is used ***to detect the remaining-battery-capacity level immediately before the paper transfer operation is performed for the print operation for each of the plurality of sheets of the paper.***

As noted above, in the Horigome patent, the battery capacity is detected after printing has already commenced, during each line when the carriage is decelerating. Therefore, the battery capacity is checked after the paper has already been transferred (e.g., from a paper cassette to a printing section). Although the Horigome patent does determine whether a battery capacity is sufficient to print a desired number of sheets, it does so during a battery charging operation, not immediately before a paper-feed operation, and does not do so for each sheet as is claimed. Accordingly, claims 1 and 11 are not anticipated by the Horigome patent for at least this reason. Since claims 2-10 depend, either directly or indirectly, from claim 1, and since claims 13-20 depend, either directly or indirectly, from claim 11, these claims are similarly not anticipated by the Horigome patent.

To summarize, the present invention checks a battery capacity before each sheet is transferred. Thus,

if a print job is for a number (N) of sheets, but there is only sufficient battery capacity to complete less than the full number (N) of sheets, the present invention will print a part of the print job until it cannot complete another sheet. None of the prior art references teach this feature.

With regard to dependent claim 2, the applicant notes that the Examiner did not address this claim in the rejection under 35 U.S.C. § 102. Since this claim is similar to claim 12, the undersigned believes that Examiner intended to only reject it under 35 U.S.C. § 103.

App  
recovery  


With regard to dependent claims 3 and 13, these claims recite that the battery capacity level is checked to see if at least one sheet of paper can be transferred and printed. The levels checked by the Horigome patent (whether carriage and paper feed motors be driven simultaneously, and, apparently, whether the printer in danger of not being able to complete another line and recap ink jet head) are different. Claims 4 and 14, which depend from claims 3 and 13, respectively, further specify not commencing a paper transfer operation in the event that the sheet cannot be transferred and printed. Accordingly, these claims are not anticipated by the Horigome patent for these further reasons.

With regard to dependent claims 7 and 17, and claims 8 and 18 which depend, respectively, therefrom, a partial number of sheets can be printed. In the second embodiment of the Horigome patent in which a battery capacity is checked during the charging of a battery, the



charging is stopped only when all of the desired number of sheets can be printed. Accordingly, these claims are not anticipated by the Horigome patent for this further reason.

With regard to dependent claims 10 and 20, since the Examiner concedes that the Horigome patent does not teach this feature (See Paper No. 5, page 6.), it is improper to reject these claims under 35 U.S.C. § 102.

#### REJECTIONS UNDER 35 U.S.C. § 103

Claims 2 and 12 stand rejected under 35 U.S.C. § 103 as being unpatentable over the Horigome patent (as applied to claims 1 and 11 above) in view of U.S. Patent No. 6,067,101 (hereafter referred to as "the Arakawa patent"). The applicant respectfully requests that the Examiner reconsider and withdraw this ground of rejection in view of the following.

The Examiner concedes that the Horigome patent fails to teach a removable battery source, but relies on the Arakawa patent as teaching such a removable battery source. (See, Paper No. 5, page 5.) Even assuming, arguendo, that the Arakawa patent provides such a teaching, it does not compensate for the deficiencies of the Horigome patent as applied to claims 1 and 11, set forth above. Since claims 2 and 12 depend from claims 1 and 11, respectively, they are not rendered obvious by the Horigome and Arakawa patents for at least this reason.

Claims 10 and 20 stand rejected under 35 U.S.C. § 103 as being unpatentable over the Horigome patent (as

applied to claims 3 and 13 above) in view of U.S. Patent No. 6,247,777 (hereafter referred to as "the Shimoda patent"). The applicant respectfully requests that the Examiner reconsider and withdraw this ground of rejection in view of the following.

The Examiner concedes that the Horigome patent fails to teach a temperature dependent battery capacity determination, but relies on the Shimoda patent as teaching such a test. (See, Paper No. 5, page 6.) Even assuming, arguendo, that the Shimoda patent provides such a teaching, it does not compensate for the deficiencies of the Horigome patent as applied to claims 3 and 13, set forth above. Since claims 10 and 20 depend from claims 3 and 13, respectively, they are not rendered obvious by the Horigome and Shimoda patents for at least this reason.

Moreover the Shimoda patent teaches checking temperature to (i) prevent failure of ink discharge (See, e.g., column 2, lines 11-17.), and (ii) prevent head deformation (See, e.g., column 2, lines 38-43.) That is, the Shimoda patent is concerned with head print failure, not the dependency of battery capacity on temperature. Therefore, there is no suggestion to combine the references as proposed by the Examiner. Accordingly, claims 10 and 20 are not rendered obvious by the Horigome and Shimoda patents for at least this additional reason

#### **Claim Amendments**

Claims 1 and 11 have been amended to clarify that the battery check is performed before a "paper transfer"


operation. These amendments are supported, for example, by page 11, lines 14-17, page 18, lines 11-14, page 18, line 25 through page 19, line 3, page 22, line 22 through page 23, line 3, page 26 lines 3-7, etc.

**Conclusion**

In view of the foregoing amendments and remarks, the applicant respectfully submits that the pending claims are in condition for allowance. Accordingly, the applicant requests that the Examiner pass this application to issue.

Respectfully submitted,

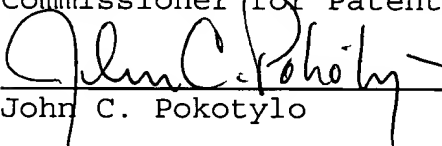
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**CERTIFICATE OF MAILING under 37 C.F.R. 1.8(a)**

I hereby certify that this correspondence is being deposited on **November 21, 2002** with the United States Postal Service as first class mail, with sufficient postage, in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

  
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Reg. No. 36,242



SEPARATE SHEETS WITH MARKED-UP VERSION OF CHANGES TO THE  
SPECIFICATION IN ACCORDANCE WITH 37 CFR § 1.121(b)(2)(iii)

The paragraph starting at page 1, line 8 has been amended as follows:

The present invention relates to a battery-operable printer, and more particularly, [the invention] relates to a printer having a function for checking whether remaining battery capacity has a battery-capacity level sufficient to perform paper transfer operations and print operations. (Hereinbelow, the "paper" refers to paper on which printing is to be performed).

The paragraph starting at page 1, line 19 has been amended as follows:

With technical advances toward compactness and high pixel density of electronic image pickup elements, lightweight and compact electronic image pickup devices have been developed, and are practically used. [In]With the advent of such compact and lightweight electronic image pickup devices, demands are made for compact and lightweight portable printers for printing object images taken by the electronic image pickup devices. In particular, demands are increased for portable printers capable of printing still images of objects taken by the electronic image pickup devices on paper. A conventional example of the portable printers can be operated by two power sources, i.e., one is a commercial power source, and the other is a battery power source. The printer can therefore be driven by the battery power source to perform

print operation when the printer is hand-carried.

The paragraph starting at page 2, line 11 has been amended as follows:

However, when the portable printer is operated using the battery to perform printing, problems occur. In the printer, print operation [is]may be forced to terminate because of depletion in the battery power. In addition, when printing is resumed after the battery has been replaced, problems such as deviations and the like can occur in print positions before printing terminates and after printing has resumed. To prevent the problems such as print termination and print-positional deviations, techniques have been proposed. Japanese Unexamined Patent Application Publications No. 4-200185 and No. 11-177912, each of which disclose a printer including a function of checking whether the remaining battery capacity is at a level sufficient to perform printing to produce a desired number of sheets.

The paragraph starting at page 3, line 8 has been amended as follows:

Japanese Unexamined Patent Application Publication No. 11-177912 discloses a technique similar to [the]those introduced above. According to the technique, a power-source detecting circuit, a warning unit, and a print-information preserving unit are provided in a control circuit that controls a printer. When the print size and the number of sheets are specified, and a print-commencing command is input to the printer, the control circuit drives

and controls the power-source detecting circuit to detect the remaining capacity of a power-source battery, and determines whether the printer is capable of performing printing meeting the input requirements for the print size and the number of sheets. If a shortage is foreseen to occur in the remaining capacity of the power-source battery which is required to perform printing meeting the input requirements, the control circuit forcibly disables the print operation and controls the warning unit to display information prompting a user to replace the power-source battery with a new one.

The paragraph starting at page 6, line 12 has been amended as follows:

According to Japanese Unexamined Patent Application Publication No. 4-200185, battery-capacity checking is performed before a sheet of recording paper is transferred, but nothing is disclosed regarding a method of increasing number of sheets of the paper to as many as possible. The method is required when printing is performed on a large number of sheets of the paper.

The paragraph starting at page 19, line 24 has been amended as follows:

If the printer 1 has been powered on, S1 is answered as YES, and remaining battery capacity is detected (S2). [Subsequently]Subsequent to S2, a determination is made whether the detected remaining battery capacity is higher

than or equal to a predetermined capacity (predetermined remaining capacity) (S3). If the remaining capacity is lower than the predetermined remaining capacity, S3 is answered as NO, and processing proceeds to S4[,] where a notification of shortage in remaining battery capacity is displayed, and processing then terminates. On the other hand, if S3 is answered as YES, nothing is executed, and processing proceeds to other processing shown in Fig. 4 and the other relevant drawing.

The paragraph starting at page 20, line 22 has been amended as follows:

First, at S11, a user performs an input operation by using the input keys 16 to specify print-desired data of the compressed image data retrieved and stored in the SDRAM 22. At S12, the number of sheets of paper that correspond to the image data specified through the input keys 16 at [S1]S11 is input by using the input keys 16.

SEPARATE SHEETS WITH MARKED-UP VERSION OF CLAIMS PER 37  
C.F.R § 1.121(c) (1) (ii)

Claim 1 has been amended as follows:

1 1. (AMENDED) A printer comprising:  
2 a printing section for performing printing on paper;  
3 a paper feed section for transferring paper, which is  
4 fed from a paper feed cassette, to said printing section;  
5 a battery power source;  
6 a remaining-battery-capacity detector for detecting a  
7 remaining-battery-capacity level of said battery power  
8 source;  
9 a print-operation-commencement specifying section for  
10 specifying print-operation commencement; and  
11 control section for performing print-operation  
12 control,  
13 wherein,  
14 said control section performs the print-operation  
15 control such that said remaining-battery-capacity detector  
16 is used to detect the remaining battery capacity level  
17 immediately before a [paper-feed]paper transfer operation  
18 is commenced for the first sheet of the paper for a print  
19 operation which is commenced corresponding to a print-  
20 operation commencement specification received from said  
21 print-operation-commencement specifying section; and  
22 said control section performs the print-operation  
23 control such that when printing is consecutively performed  
24 on a plurality of sheets of the paper corresponding to said  
25 print-operation commencement specification, said remaining-  
26 battery-capacity detector is used to detect the remaining  
27 battery capacity level immediately before the [paper-



28 feed] paper transfer operation is performed for the print  
29 operation for each of the plurality of sheets of the paper.

Claim 8 has been amended as follows:

1 8. (AMENDED) A printer as defined in claim 7, wherein  
2 said display unit displays a number of printable sheets of  
3 the paper [(the "printable sheets" hereinbelow refers to  
4 sheets on which printing can be performed with a battery  
5 capacity)] for the information indicating that printing can  
6 be performed only for the partial number of sheets of the  
7 paper.

Claim 11 has been amended as follows:

1 11. (AMENDED) A printer comprising:  
2 a printing section for performing printing on paper;  
3 a paper feed section for transferring paper, which is  
4 fed from a paper feed cassette, to said printing section;  
5 a remaining-battery-capacity detector for detecting a  
6 remaining-battery-capacity level of a battery power source;  
7 a print-operation-commencement specifying section for  
8 specifying print-operation commencement; and  
9 a control section  
10 wherein,  
11 said control section performs print-operation control  
12 based on the remaining battery capacity level detected by  
13 said remaining-battery-capacity detector immediately before  
14 a [paper-feed] paper transfer operation is commenced for the  
15 first sheet of the paper for a print operation which is  
16 commenced corresponding to a print-operation commencement  
17 specification received from said print-operation-  
18 commencement specifying section; and

19           when printing is consecutively performed on a  
20 plurality of sheets of the paper corresponding to said  
21 print-operation commencement specification, said control  
22 section performs print-operation control based on the  
23 detected remaining battery capacity level immediately  
24 before the [paper-feed]paper transfer operation is  
25 performed for the print operation for each of the plurality  
26 of sheets of the paper.